

MISSOURI. Conservationist

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[NOTE TO OUR READERS]

Yours, Mine, Ours

What a summer this has been in Missouri! While our weather can vary greatly from year to year, we have experienced a summer much different than that of 2012. This year's cooler temperatures

and ample rainfall have provided a unique opportunity for citizens to enjoy our state's many natural resources to the fullest extent possible. In recent weeks, I had the pleasure of visiting the Mystic Plains of northern Missouri to view native grasslands and remnant prairies in their blooming splendor. If you've not had an opportunity to visit these special places, I encourage you to do so. I was also thrilled to fish the Current River in the southern portion of the state, and we all know what a special gem that river is. I am extremely fortunate to live in a place where bird watching is an everyday event and wild turkey, white-tailed deer, and bald eagles are seen with some regularity.

We have been blessed with great natural treasures in Missouri. Abundant forest, fish, and wildlife resources make this state a truly unique place. So who do these wildlife resources belong to? Are they yours, mine, or ours? Part of the answer lies in what our forefathers stated when we were a fledgling nation. In 1842, the U.S. Supreme Court ruled in the case of *Martin v. Waddell* that wildlife resources, defined in the broadest sense, are owned by no one and are to be held in trust by the government for the benefit of present and future generations. Our forefathers had great vision and each generation has an incredible responsibility to ensure that our valuable wildlife resources are passed on to the next.

We are faced with many important 21st century conservation challenges that could have lasting implications for those resources that are yours, mine, and more importantly, ours. How will we, together, manage Missouri's white-tailed deer herd so that sportsmen of today and tomorrow have access to that culturally important resource? How will we manage our state's vital grassland and remnant prairie resources that provide critical habitats for many wildlife species? How will Missouri, an important agricultural state, help feed a hungry world while ensuring our soil resources, a fundamental building block of terrestrial wildlife habitats, remain in place so streams and rivers are not harmed by erosion? In a state with a growing population, how will we encourage



Blue Spring on the Current River

outdoor recreation that facilitates understanding and appreciation of the natural world and wildlife resources without risking over-exploitation? These are important questions, and there are no easy answers.

Missouri's rich conservation history provides us with insights on how tough challenges can be met and demonstrates the power of collaborative efforts. Collaborative engagement at the grassroots level is an important first step in initiating conversations on important topics. The Department continues to engage in dialog with stakeholders on the topic of in-stream flows and potential impacts of development on vital water resources. Soon, the Department will begin discussions with citizens on the topics of deer management and deer health. These examples demonstrate the Department's commitment to engage citizens on important conservation issues.

Missouri's abundant forest, fish, and wildlife resources hold great promise for citizens of today and tomorrow. Those resources are yours, mine, and ours and will require us all to be engaged to sustain them for future generations.

Tom Draper, deputy director

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by Mark Goodwin
Though small, squirrels offer big hunting opportunities.
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by Brett Dufur
To thrive, migratory birds must find favorable habitat throughout the year, throughout the Americas.
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by Jason Summers and Emily Flinn
How disease and other factors affect our white-tailed deer population.

Cover: A common yellowthroat, by Noppadol Paothong. Read about the incredible journey of migration Missouri birds make each year, starting on Page 16.

📷 500mm lens + 2.0x teleconverter • f/8
1/200 sec • ISO 800

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WHAT IS IT?

Our photographers have been busy exploring the intricacies of the Missouri outdoors. See if you can guess this month's natural wonder. The answer is revealed on Page 7.



AFTER THE STORM

Your article on the Joplin tornado recovery with the trees was awesome [May; Page 16]. I'm from Webb City, just 10 minutes or less from Joplin. I will never forget what I saw on the news and in the newspapers, but now that we have trees and people who care about Joplin so much we will grow stronger. Thank you to all who helped plant the trees and those who donated them.

Jerome Henderson, Webb City

CLARK CO. MEMORIES

My family has lived on a 160-acre farm in Clark County for the past 40 years. Our two sons were raised in the barn lots, cornfield, timber, and stream. A sure sign of spring was when someone asked, "When can we go mushroom hunting?"

In the beginning, we traveled at the pace of preschoolers, but then they were leaving us grown-ups behind. With their dad at work, the boys and I spent hours in the timber checking

out the bugs and worms, a nest of young rabbits, the bright green tree frogs singing so loud for their size. Sliding down a steep embankment to the bed of a washed out ravine, we filled our pockets with pretty rocks, searching for an arrowhead, or piece of artifact then roaming our way to the Little Fox River to cool off.

Fishing in farm ponds was a year-round activity for us, and we all loved bass, crappie, and channel cat. My father retired the same year our first son was born, this meant that grandma and grandpa were at their disposal to go hunting, fishing, camping, and whatever the season allowed. Grandpa's favorite thing to do was to camp along the Fox River and put out bank lines to run every couple of hours all night.

Fall was hunting season, a time for deer and a time for turkeys. All of our families lived on venison all winter, as long as it lasted.

I could go on with my reminiscing, but I'll let you pick it up from here. Walk a grassy lane, look

close and see the animal tracks, butterflies, and any number of things. Fill your diary with your story, and count your blessings.

Sherry A. Dalton, Luray

CLARIFICATIONS

A line in our *Missouri River Restoration* article [June; Page 13] read: "Ultimately, the Corps built, and still maintains, a self-scouring, 9-foot-deep, 300-foot-wide, 2,321-mile-long navigation channel...." We regret the error. The length of the Missouri River is currently reported at about 2,321 miles from its source to its confluence with the Mississippi River. A series of dams in the upper basin have impounded the river and shortened the navigation channel. The Missouri River navigation channel from its confluence with the Mississippi River to Sioux City, Iowa, extends to about 735 miles, depending upon where you stop measuring along Sioux City.

The following Facebook question appeared on our July "Letters" Page. The term "pole spearfishing" has caused some confusion, so we are running the question again with additional information to clarify our response:

Is pole spearfishing the only legal spearfishing method allowed in Missouri streams? I've been reading nongame regulations on the website and that's what I thought, but I wanted to make sure.

Keith Jackson

Missouri Dept. of Conservation: If by "pole spearfishing," you mean gigging, then, yes, you may use a gig or atlatl on Missouri streams and impoundments between sunrise and midnight from Sept. 15 through Jan. 31, and on impounded waters between sunrise and sunset throughout the remainder of the year. However, if you are referring to underwater spearfishing, then, no, that method is only allowed for nongame fish in impounded waters or a temporary overflow of a river or ditch between sunrise and sunset throughout the year. See Page 10 of our Fishing Summary booklet at mdc.mo.gov/node/11414.



Reader Photo

STOP, BAT!

John Moeser, of Kelso, took this photo of an eastern red bat. "I was sitting in the backyard watching the bats with my son, when we decided to get the camera out and see if we could get any decent pictures," said Moeser. "I just used some automatic settings at first, but all I got was a blurry mess." He turned off the auto focus, because it was too slow, and turned on the flash to stop the action and get a good shot. "Then I just stood there as the bats flew around and tracked as best I could while firing off pictures," said Moeser. Living on a farm provides Moeser and his family the opportunity to watch and photograph a variety of wildlife.



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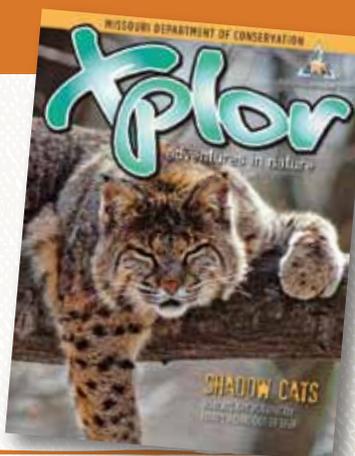
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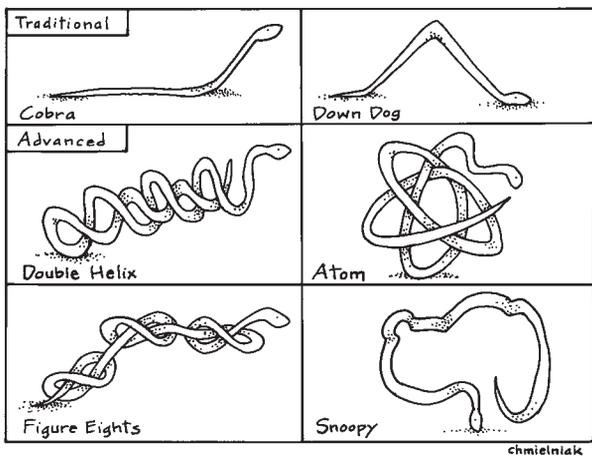
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Snake Yoga

Agent Notes

Dove Season Opens Sept. 1

HUNTERS ARE LOOKING forward to the time of year that traditionally kicks off the fall hunting seasons — the opening day of dove season.



Dove season opens Sept. 1 and runs through Nov. 9. Doves can be harvested during these dates from one-half hour before sunrise to sunset. The daily bag limit is 15. Required permits include a Resident Small Game Hunting Permit for residents age 16 through 64, unless exempt, and a Nonresident Small Game Hunting Permit for nonresidents age 16 and older. A Missouri Migratory Bird Hunting Permit is also required of residents and nonresidents age 16 and over. Before you go afield, it is always a good idea to read through the regulations. Regulations are available at permit vendors, Conservation Department offices (see Page 3), or online at mdc.mo.gov/node/3607. The Web page also includes a link to conservation areas managed for public dove hunting.

Mourning doves are one of the most abundant birds in North America. In fact, more mourning doves are harvested each year than all other migratory bird species combined. Doves are a great way to introduce kids to hunting. There are plenty of shooting opportunities and the action can be fast. Be sure to practice shooting trap or skeet prior to the season to increase your odds of success and minimize wounding birds. The Conservation Department has five staffed ranges that provide various trap and/or skeet shooting opportunities. To learn more, call your regional office (see Page 3) or visit mdc.mo.gov/node/6209.

A trip to the dove fields is a great way to usher in the fall hunting season.

Rudd Binsbacher is the conservation agent in Clark County. If you would like to contact the agent for your county, phone your regional conservation office listed on Page 3.

HUNTING AND FISHING CALENDAR

FISHING	OPEN	CLOSE
Black Bass from Ozark Streams	05/25/13	02/28/14
Bullfrogs and Green Frogs	Sunset	Midnight
	06/30/13	10/31/13
Nongame Fish Gigging	09/15/13	01/31/14
Paddlefish on the Mississippi River	09/15/13	12/15/13
Trout Parks	03/01/13	10/31/13

HUNTING	OPEN	CLOSE
Coyote	05/06/13	03/31/14
Deer		
Archery	09/15/13	11/15/13
	11/27/13	01/15/14
Firearms		
Urban	10/11/13	10/14/13
Early youth	11/02/13	11/03/13
November	11/16/13	11/26/13
Antlerless (open areas only)	11/27/13	12/08/13
Alternative Methods	12/21/13	12/31/13
Late Youth	01/04/14	01/05/14
Doves	09/01/13	11/09/13
Furbearers	11/15/13	01/31/14
Groundhog	05/06/13	12/15/13
Pheasant		
Youth (North Zone Only)	10/26/13	10/27/13
North Zone	11/01/13	01/15/14
Southeast Zone	12/01/13	12/12/13
Quail		
Youth	10/26/13	10/27/13
Regular	11/01/13	01/15/14
Rabbit	10/01/13	02/15/14
Sora and Virginia rails	09/01/13	11/09/13
Squirrel	05/25/13	02/15/14
Turkey		
Archery	09/15/13	11/15/13
	11/27/13	01/15/14
Firearms	10/01/13	10/31/13
Waterfowl	see the <i>Waterfowl Hunting Digest</i> or mdc.mo.gov/node/3830	
Wilson's (common) snipe	09/01/13	12/16/13
Woodcock	10/15/13	11/28/13

TRAPPING	OPEN	CLOSE
Beaver and Nutria	11/15/13	03/31/14
Furbearers	11/15/13	01/31/14
Otters and Muskrats	11/15/13	02/20/14

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code* and the current summaries of *Missouri Hunting and Trapping Regulations* and *Missouri Fishing Regulations*, *The Spring Turkey Hunting Regulations and Information*, *the Fall Deer and Turkey Hunting Regulations and Information*, *the Waterfowl Hunting Digest*, and *the Migratory Bird Hunting Digest*. For more information visit mdc.mo.gov/node/130 or permit vendors.

ASK THE Ombudsman



Carp pharyngeal teeth



Q. We found some teeth near Bull Shoals Lake that had all of us stumped. My dad said he has seen lots of teeth but nothing like these. We would love to know what animal grew them.

A. Those teeth are confusing because they didn't come from a mouth. Your photo is of the pharyngeal (throat) teeth of a fish called the grass carp. Grass carp are native to rivers in Siberia and China. They have been widely introduced into North American rivers, lakes, and ponds as a natural means of controlling the growth of vegetation. The species is a very large member of the minnow family that, in its native range, can reach a length of 4 feet and a weight of 100 lbs. The Missouri record grass carp was taken by archery methods and weighed 71 lbs. 4 oz. Grass carp have a preference for aquatic vegetation and have been reported to consume

more than their own weight in vegetation in a day. The grooved pharyngeal teeth function to grind vegetation prior to swallowing it. There is a left and right set of teeth that mesh together to create the grinding mechanism.

Q. I spooked a groundhog and he took off running. To my surprise, he went up a tree and stayed there, about 10 to 15 feet high. I took a photo to prove it.

A. Most people are surprised to see a groundhog climb a tree because the species is usually observed feeding or running on the ground or lounging near

an underground burrow. Because they prefer to build their burrows in rocky or sandy, sloping ground, they are often seen on grassy slopes beside roadways. Groundhogs, also called woodchucks, have powerful legs and claws on their toes. They are quite capable of climbing and will do so to obtain ripe fruits in trees, especially pawpaws, and to escape from danger on the ground. They are occasionally treed by dogs.

Q. I recently observed a kingfisher going into a hole in the dirt bank of a creek. Would you please explain that behavior?

A. Kingfishers excavate nest burrows in the sandy loam soils of river and stream banks. These burrows can extend from 3 to 6 feet back into the bank. The entrance tunnel slopes uphill, possibly to keep rain or floodwaters away from the nest. The nesting in the dirt burrow may explain why the female kingfisher is brightly colored because, unlike open-nesting birds, camouflage is unnecessary to hide her from predators while on the nest.

Ombudsman Tim Smith will respond to your questions, suggestions, or complaints concerning the Conservation Department.
Address: PO Box 180, Jefferson City, 65102-0180
Phone: 573-522-4115, ext. 3848
Email: Ombudsman@mdc.mo.gov



Woodson K Woods Memorial Conservation Area

2013 Early Migratory Bird Seasons

A 16-day teal season and increased limits are the big news in this year's federally approved early migratory bird hunting regulations. The U.S. Fish and Wildlife Service approved the teal season length and increased the daily limit from four to six blue-winged and green-winged teal in the aggregate. Missouri teal season dates, approved by the Conservation Commission in May, will be Sept. 7 through 22. Also approved by the Conservation Commission were the following seasons.

- **Mourning doves, Eurasian collared doves, and white-winged doves:** Sept. 1 through Nov. 9, daily limit 15 in the aggregate.
- **American woodcock:** Oct. 15 through Nov. 28, daily limit three.
- **Wilson's (common) snipe:** Sept. 1 through Dec. 16, daily limit eight.
- **Sora and Virginia rails:** Sept. 1 through Nov. 9, daily and possession limit 25 in the aggregate.

The U.S. Fish and Wildlife Service also increased the possession limit for most early migratory game birds from two to three times the daily limit. The only exception is rails, for which the daily and possession limits remain 25.

Conservation Department Resource Scientist Doreen Mengel says state and federal waterfowl biologists approved the changes after careful consideration and analysis of possible effects on migratory bird populations.

"We are confident that the increased daily limit for teal and larger possession limits for most other species will not have an adverse effect on bird numbers," says Mengel. "Weather and habitat conditions are the most important limiting factors on these species' nesting success."

Duck Hunters Get More Spots Through "Poor Line"

Hunters who plan to apply for reservations at Conservation Department managed wetland areas will find the same three areas under the Quick Draw system this year. The only change is an increase in the number of hunting spots to be allocated through the "poor line."

You can apply for reservations at 12 wetland areas from Sept. 1 through 15 at mdc.mo.gov/7559. Eagle Bluffs, Grand Pass, and Otter Slough

Tell Us How Conservation Areas Are Important to You

The Conservation Department wants to know what you think about conservation areas (CAs) and how they should be managed. The Department is updating CA management plans and wants your comments. Drafts of individual management plans will be available at mdc.mo.gov/areaplans starting this month. This Web page also has information about how to send comments.

Area management plans focus on resource management and public use. They do not address hunting, trapping, or fishing regulations.

The Department will consider all ideas received and will work to balance the issues and interests identified with the responsibility of managing areas for the present and future benefits to forest, fish, wildlife, and people.

Decisions on which ideas to incorporate into area plans and on how to best incorporate them will be based on the property's purpose, its physical and biological conditions and capabilities, the best roles of the property in its local, regional, and state-wide context, and on the professional expertise of Department staff.

conservation areas are still under Quick Draw. For those three areas, a drawing on Monday of each week will assign hunting slots for the following Friday through Monday. A Quick Draw each Thursday will assign slots for the following Tuesday through Thursday.

The traditional system assigns reservations months in advance. Quick Draw allows hunters to take weather and other conditions into account when deciding when and where to apply.

Neither Quick Draw nor the traditional systems allows nonresidents to apply for reservations. However, resident hunters who draw reservations can include nonresidents in their hunting parties. Also, nonresidents can take part in the daily, on-site "poor-line" drawings under both systems.

Under Quick Draw, the computer drawing determines the order in which successful applicants are allowed to select hunting spots. It also determines where hunting spots for the "poor line" will fit in the daily order of selection. On any given day, the No. 1 spot can be in either the Quick Draw or "poor-line" portion of the draw.

In previous years, Quick Draw allocated four out of five hunting spots to successful applicants. This year, only three of four spots will

be assigned through Quick Draw, leaving one in four slots for hunters who vie for spots in the daily drawing.

Whetstone Creek Youth Dove Clinic

Unlike deer, turkey, and many other types of hunting, which involve long hours of waiting, dove hunting at its best can mean nonstop action. This makes it a good choice for introducing youngsters to hunting. A dove-hunting clinic in Callaway County Aug. 31 and Sept. 1 is a great way for hunters age 8 through 15 to get a taste of this action-packed sport.

The clinic begins on Saturday at Prairie Fork Conservation Area (CA) with instruction in hunting safety, dove biology, dove management, regulations, hunting strategy, and wing-shooting from 4 to 8 p.m. Dinner is provided, and there will be a drawing for door prizes. Participants will put their knowledge into practice on Sunday, hunting on a field reserved for them at Whetstone Creek CA.

Parents or adult mentors are encouraged to accompany youth participants. Guides will be provided if needed. Participants may use their own equipment, but shotguns and ammunition also will be provided. Youths must be hunter-



education certified or accompanied by a licensed adult. Only 15 spots are available in the clinic, so register now by calling 573-254-3330.

Missouri leads the nation in recruiting new hunters, thanks to numerous conservation areas, youth-only seasons, low-cost permits, and Conservation Department-sponsored outdoor education programs.

Honor Significant Conservationists

The Conservation Commission wants your help identifying citizen conservationists who deserve recognition through the Master Conservationist and Missouri Conservation Hall of Fame pro-



WHAT IS IT?

Prairie Blazing Star

Liatris pycnostachya

On Page 1 and left is a blazing star that reaches up to 5 feet high and blooms July through October. Blazing star grows in glades, upland prairies, ledges and tops of bluffs, savannas, openings of upland forests, and (rarely) banks of streams. They are scattered throughout the state. Native Americans and early settlers ate the roots raw or baked. Blazing star is one of the showier plants used in native wildflower gardens. A wide variety of insects visit the flowers, and birds feed on the seeds. The sweet, thickened rootstocks are relished by voles and other herbivorous mammals. Blazing stars are an important (and showy) part of the complex community of plants in the tallgrass prairie. —photo by Noppadol Paothong

(continued from Page 7)

grams. The Master Conservationist Award honors living or deceased citizens while the Missouri Conservation Hall of Fame recognizes deceased individuals. Those who can be considered for either honor are:

Citizens who performed outstanding acts or whose dedicated service over an extended time produced major progress in fisheries, forestry, or wildlife conservation in Missouri.

Employees of conservation-related agencies who performed outstanding acts or whose dedicated service over an extended time produced major progress in fisheries, forestry, or wildlife conservation in Missouri.

Anyone can submit a nomination, which should include a statement describing the nominee's accomplishments and a brief biography. Criteria and nomination forms for each award

are available at mdc.mo.gov/node/7763 and mdc.mo.gov/node/7759. Please submit nominations by Oct. 1 to Denise Bateman, Missouri Department of Conservation, PO Box 180, Jefferson City, MO 65102-0180, Denise.Bateman@mdc.mo.gov.

Find a Public Dove Hunting Area Near You

Dove hunting season opens Sept. 1. To provide quality hunting opportunities, the Conservation Department plants sunflowers, wheat, millet, and other crops on dozens of conservation areas (CAs) statewide. Dove-field locator maps are available at mdc.mo.gov/18183. Crops grow better on some areas than others, so advance scouting is important. Heavy rains and flooding this spring affected some dove management fields, but significant opportunities remain.

Safety consciousness is particularly important on public hunting areas. Hunters should space themselves at safe intervals. Don't shoot at birds lower than 45 degrees above the horizon. Politely call attention to safety issues the first time they arise. If you plan to introduce a new hunter to doves, leave your own shotgun at home, so you can devote your full attention to your protégé.

Hunters are asked to report any doves they shoot that have leg bands. To report bands, call 800-327-2263 or visit reportband.gov. You will need to give the band number, and where and when the bird was killed.

Don't Move Firewood!

The discovery of emerald ash borers in two more Missouri counties means Missourians must be more careful than ever not to spread the destructive forest pest.

Bollinger and Pulaski are the two latest counties where routine monitoring revealed infestation of the half-inch, metallic-green beetles. In response, the Missouri Department of Agriculture has expanded a quarantine regulating the movement of many ash wood products to reduce the spread of the borer. Other counties also under quarantine are Carter, Clay, Iron, Madison, Platte, Reynolds, Shannon, and Wayne.

The quarantine limits the movement of ash wood products from these counties. It covers all



Katy Trail in Hartsburg

Guides Perfect for "100 Missouri Miles"

Gov. Jeremiah "Jay" Nixon wants Missourians to hike, bike, or paddle 100 miles. The Missouri Department of Conservation wants to make it easy.

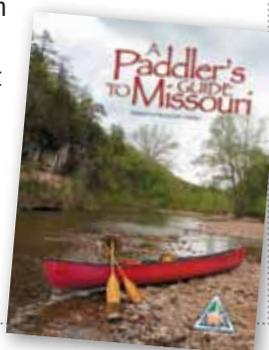
In June, Gov. Nixon launched the "100 Missouri Miles" initiative, challenging Missourians to hike, bike, or paddle 100 miles in Missouri by the end of the year. (See 100missourimiles.com). The challenge encourages Missourians to enjoy healthful outdoor activities with family and friends. Gov. Nixon rolled out the initiative on the heels of the nonprofit American Trails naming Missouri the No. 1 trail state in the nation.

Dovetailing perfectly with the governor's initiative is a new book and an online service from the Conservation Department. The book is an updated edition of the *Paddler's Guide to Missouri*. The 94-page, 8.5- by 11-inch book features maps and detailed descriptions of nearly 3,000 floatable miles on 58 streams and rivers.

The guide is available for \$8 per copy (plus shipping and tax, where applicable) at Conservation Department offices, nature centers, and the Department's online Nature Shop, mdcnatureshop.com. Buy your copy at a conservation nature center or regional office in August and get a 20-percent discount.

If paddling doesn't "float your boat," the Conservation Department has an impressive compendium of information about more than 700 miles of foot, bicycle, and equestrian trails at 146 conservation areas and nature centers around the state. All this information is available free in a searchable database at mdc.mo.gov/node/3392.

These are just two ways the Conservation Department helps Missourians discover nature.



DID YOU KNOW?

The Department of Conservation serves nature and you.

parts of ash trees, from logs and green lumber to compost, bark, chips, and nursery stock, as well as all hardwood firewood. To move affected products, you must first enter into a compliance agreement through USDA-APHIS Plant Protection and Quarantine.

The emerald ash borer kills ash trees by tunneling beneath their bark, cutting off the flow of water and nutrients between tree roots and crowns. No ash species is resistant to the pest, which has virtually eliminated ash trees from millions of acres of forest in the eastern United States.

Much of the pests' spread results from people unknowingly transporting infested firewood, logs, and tree debris. Missouri's quarantine prohibits both interstate and intrastate movement of such products. Detailed information about the borer and the quarantine is available at eab.missouri.edu.

Champion Tree Vacancies Filled

Many trees live longer than humans do, but none live forever. And while some trees may be the biggest ones of their kind today, other specimens may outgrow them over time. Those are the reasons Missouri got two new champion trees this spring.

High winds on May 31 toppled the state-champion eastern cottonwood, which stood on Columbia Bottom Conservation Area in St. Louis County. The tree had a circumference of 25.8 feet, a height of 127 feet, and 103-foot spread. A 5-foot portion of the trunk remained after the storm, but the rest was snapped off.

The tree's demise cleared the way for champion designation of a cottonwood on private property in Platte County. That tree has a trunk circumference of 28.3 feet, a height of 78 feet and a spread of 158 feet. To put that into practical terms, the tree is big enough to shade half a football field.

Another new champion is the 98-foot-tall northern red oak on Jim Weyland's property in Howard County. The tree has a circumference of 18 feet, and a crown spread of 74 feet. It became the new state champion when the Conservation Department was unable to find and re-measure the previous champion.

The Conservation Department revisits champion trees periodically to make sure they are still alive and to re-measure them in case they have

grown or declined significantly. Weyland's tree, first measured in 1996, had gained 16 inches in circumference in the intervening 17 years.

Do you think you may have a champion tree? Visit mdc.mo.gov/node/4831 to find information on how to nominate your tree.

State Fair Offerings Include Live Demos

One of the ways the Conservation Department helps people discover nature is through exhibits, live programs, and hands-on activities at the Missouri State Fair. This year's fair offerings will include appearances by a live barred owl

and bald eagle on opening day, fish cooking and cleaning demonstrations using Asian carp, wildlife calling, tree identification, bowfishing, a portable sawmill, landscaping to control storm water, water safety, feral hogs, fly tying, and dealing with nuisance wildlife around your home. Perennial favorites, such as the air-conditioned Conservation Kids' Room and aquariums and terrariums with Missouri fish, amphibians, and reptiles will be back, along with a few surprises. The conservation pavilion, located at the south end of the fairgrounds, is open from 9 a.m. to 9 p.m. daily. The Kids' Room hours are from 10 a.m. to 6 p.m.

Mission

- » To protect and manage the forest, fish, and wildlife resources of the state; to facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.

Vision

- » The Department shall be a forward-looking agency, implementing solid core values ensuring integrity and trust, using adaptive learning and creative thinking, embracing technology, and providing superior public service—to be the national leader in forest, fish, and wildlife management proactively advancing our mission through understanding natural resource and social landscapes.

Goals

- » Ensure healthy and sustainable forest, fish, and wildlife resources throughout the state.
- » Manage lands held in public trust and associated infrastructure to ensure continued benefit to citizens and to forest, fish, and wildlife resources.
- » Ensure sound financial accountability and transparency in all areas of operation.
- » Provide opportunities for active citizen involvement in services and conservation education in both rural and urban areas.
- » Engage partners at all levels (individual, community, county, state, federal) to enhance natural resources and effective delivery of conservation services.

Conservation Priorities

- » The Department has developed 27 priorities based on our five goals. To read more about these priorities, visit mdc.mo.gov/node/21547. To view a video about the priorities, visit mdc.mo.gov/node/3424.



SQUIRREL HUNTING: Getting Started

Though small, squirrels offer big hunting opportunities.

by MARK GOODWIN



SQUIRRELS DON'T RECEIVE A LOT OF ATTENTION FROM TODAY'S HUNTERS. Most focus on other game, such as deer and turkeys, which is understandable. Deer and turkeys are big game — and a big deal. Many hunters can remember when deer and turkeys were few. Squirrels are small, and their populations have never been threatened. Squirrels are, well, just common.

Yet consider these facts about the squirrel as a game animal: The hunting season for squirrels is one of Missouri's longest, extending from late May through mid-February; bag limits are liberal: 10 squirrels a day; practically any stand of mixed hardwood timber, of a few acres or more, will support huntable squirrel populations; and, when taken with a rifle, shooting squirrels requires pin-point accuracy — a challenge for any marksman. As table fare, no game animal is better. If you have overlooked squirrels as a hunting opportunity, reconsider. Here are some tips to get you started.

PHOTO BY DAVID STONNER;
ILLUSTRATION BY CHARLES SCHWARTZ

Know Your Trees

The two species of squirrels you can hunt in Missouri are gray squirrels and fox squirrels. Trees provide these animals with most of their food, as well as a place to live and raise their young. Accordingly, gray and fox squirrels are collectively known as tree squirrels.

Knowledge of tree species is key to finding good squirrel populations. The Department of Conservation offers an excellent reference on tree identification through the online Field Guide at mdc.mo.gov/node/73. There is also a printed *Trees of Missouri Field Guide*, available for \$7.50 (plus shipping and handling). You can order a copy at mdcnatureshop.com or by calling 877-521-8632. You may also purchase one at a conservation nature center or regional office near you (See Page 3).



The two species of squirrels you can hunt in Missouri are gray squirrels (above) and fox squirrels. The hunting season extends from late May through mid-February.

Missouri's woodlands are dominated by various species of oaks and hickories. All produce nuts that begin to ripen in August and serve as food for squirrels throughout the winter. Most squirrel hunters focus their hunting when hickory nuts and acorns first ripen. The sounds of squirrels scurrying among branches and cutting nuts make them easier to locate and provide exciting action. Yet excellent squirrel hunting can also be found when squirrel season opens in late spring. The key: mulberry trees.

Two species are found in Missouri, red mulberry and white mulberry. Both species produce fruit from late May until early July. Find a fruiting mulberry tree in woods that support a healthy squirrel population and fine hunting is all but assured. But there is a catch, mulberry trees, though found throughout Missouri, do not dominate our woodlands. They occur scattered, here and there, and not every mulberry tree produces fruit. Male flowers and female flowers commonly occur on different trees. Only trees with female flowers produce fruit. Sometimes it takes a little searching to find a female tree.

Mulberry trees do not have to be big to draw large numbers of squirrels. A tree less than 20 feet tall and less than a foot across at the stump, if loaded with fruit, will draw squirrels for weeks. Look for mulberry trees at the edge of woods or growing in the richer soil along stream bottoms.

When mulberry production drops off in July, squirrels turn their appetites to the fruits produced by black cherry trees and hackberry trees. Just before the nuts of oaks and hickories ripen, squirrels feed heavily on the fruits of black gum trees. Like mulberry trees, male flowers and female flowers of the black gum occur on different trees. Find a fruiting black gum, however, and it will be worth your efforts. In southeast Missouri, squirrels also feed on the seedpods of yellow poplar.

Gear and Guns

Equipment and clothing for squirrel hunting is simple. During the warmer months, light camouflage is in order. For safety, a hunter orange cap is a good idea. When you are stalking to get in shooting range of a squirrel, if you find the hat compromising your approach, take it off and lay it on the ground. If you have already killed a few squirrels, lay your orange hat on the ground alongside your squirrels as a good way to relocate them after you have made your stalk.

An easy way to carry squirrels is to cut a hole in one of the hind feet, then thread them on a small green stick that you cut to 3 or 4 inches in length and sharpen on both ends. The stick fits well across your fingers.

Up until the killing frosts of November and early December, squirrel hunters must deal with ticks, chiggers,



and mosquitoes. You may want to treat your clothes with a permethrin-based spray, which kills ticks, as well as a deet-based spray, which you can spray on your clothes, as well as your skin, to repel ticks, chiggers, and mosquitoes. Or take other measures to avoid bites from these pests.

If you are allergic to poison ivy, that's another hazard to look out for. Visit the online Field Guide if you need a refresher on what it looks like.

Choice of firearm is up to the hunter. A muzzleloading rifle, even of heavy caliber, is well suited for taking squirrels if all shots are limited to the head. A scoped .22 pistol is another option that adds challenge to squirrel hunting.

Most squirrel hunters choose to hunt with either a scoped .22 rifle or a shotgun. A .22 rifle, if all shots are limited to the head, leaves squirrels in fine shape for cooking. The shooting is quite challenging. Shotguns are a great choice for hunting squirrels, though efforts must be made to reduce the chance of riddling squirrels with pellets. Use large shot size, like 4s, which limits the number of pellets. Learn your shotgun's pattern at different ranges and hold your aim in front of a squirrel so as to just hit the squirrel's head with the edge of your pattern. Also, try and limit shots to when only a squirrel's head is visible, like when one peeks from behind a limb. Always be aware of what is behind your target before you shoot.

For hunting squirrels, choice of firearm is up to the hunter. Most squirrel hunters choose to hunt with either a scoped .22 rifle or a shotgun. Always be aware of what is behind your target before you shoot.

Hunting Strategy

The number-one key to hunting any game animal is placing yourself where the animals are at times when they are active. Doing so requires knowledge of the animals you hunt. Here's a basic rundown on the habits of gray and fox squirrels.

In early morning, they emerge from their leaf nests or den trees and are active for two or three hours, with much of this time spent feeding. Midday, gray and fox squirrels tend to loaf on limbs or sleep. During the last two or three hours of daylight they are active again, feeding until close to dark, at which time they return to their leaf nests or dens for the night.

Gray and fox squirrels have two breeding seasons in Missouri: one that extends from late May through early July, and another from late December through early February. During these breeding seasons, squirrels are often active all day, with male squirrels fighting among themselves or chasing females.



Both gray and fox squirrels make a variety of sounds. To express excitement and warn other squirrels, they give a rapid call that sounds like “*cherk-cherk-cherk*.” Other calls include grunts, purrs, and chattering of teeth, the meaning of which may be varied.

Weather conditions and time of day are important concerns when planning a squirrel hunt. During warm months, watch the weather forecast. If morning temps are predicted to be in the 60s or lower, you can enjoy several hours of comfortable hunting if you start hunting at first light. If temps are forecast with lows in the 70s, it’s best to postpone hunting for another day. By early morning it will already be warm and uncomfortable in the woods.

Wind is another consideration. Windy days put limbs in motion, which make it difficult to spot squirrels as they feed and move in the trees. Best days for squirrel hunting are when there is little or no wind. Mornings are often preferable, because winds tend to be lighter.

Once you have located concentrations of squirrels, hunting strategy follows two methods: sitting in one spot and waiting for squirrels to move and reveal their presence, or still-hunting, which involves quietly walking through the woods, with frequent stops to look and listen

If squirrels are not active, a good way to make them reveal themselves is to shake the limb of an understory tree and bark like a squirrel.

for squirrels. With both methods, sit or move with the sun at your back. This makes it easier for you to spot squirrels and makes it more difficult for squirrels to spot you.

Regardless of hunting method, often when you see a squirrel it will be too far away for a good shot, which requires you to move to get closer. Move when the squirrel is actively reaching for nuts or chasing another squirrel. Being distracted, the squirrel will be less likely to see you. Use the trunks of larger trees and the leafy limbs of smaller ones to hide your approach.

If you are still-hunting for squirrels, every 10 steps or so, pause to look. If you end up just walking through the woods, you will fail to see many squirrels. If squirrels are not active, a good way to make them reveal themselves is to shake the limb of an understory tree and bark like a squirrel. This will often cause squirrels to bark back. You can use the same strategy to get a squirrel feeding at the top of a leafy tree to come down and take a look, putting it in better range for a good shot.



How to Clean Squirrels

The first step to converting squirrels to cuisine is proper cleaning. Here's how.

Even if you make a good head shot on a squirrel, it is a good idea to remove the chest and abdominal organs so the body cools quickly. If you accidentally shoot a squirrel through the abdomen, removing the viscera and rinsing the body cavity with water is critical to prevent gut and bladder contents from tainting the meat.

To remove the entrails, use the tip of a small, sharp knife, and make an incision where the ribs meet the abdomen. Cut toward the animal's hindquarters, taking care not to puncture the internal organs. Once the viscera is exposed, look for the urinary bladder. If it is full, pinch the neck of the bladder between thumb and forefinger and carefully cut to remove it. This prevents spills. With the bladder removed, split the pelvis and pull out the rest of the insides. That's all there is to eviscerating a squirrel.

Skinning a squirrel is tougher. Done wrong, the meat will be covered with loose hair — a real mess. Follow this method to leave squirrel meat free of hair and ready for cooking. First, immerse the animal in a bucket of water. Slosh it around a few times to ensure that the water soaks all the way to the squirrel's skin. This causes the hair to hold together and reduces the chance of hair contacting the meat while you skin the squirrel.

With this done, make a slit along the hide beneath and at the base of the tail. Cut through the tail but leave it attached to the back skin. Cut an inch or so further up the back and extend the cut along the squirrel's flanks. With these cuts made, step on the tail and pull on the skin attached to the hind legs. This will strip the skin nearly all the way down the hind and forelegs.

Pull the skin over the forelegs and hind legs, then cut off the head and feet with a knife. During this process, frequently dip your hands and knife in the bucket of water

In the Kitchen

PAN-FRIED SQUIRREL

When you clean squirrels, separate the young ones from the old ones. Young squirrels are for frying. How do you distinguish young squirrels from old? Old male squirrels have a large scrotum with well-developed testicles, young males don't. Old females often lack hair around their nipples from having nursed young, whereas young females show no signs of nursing. Young squirrels are often smaller than old ones, and the skin of young squirrels pulls off more easily than that of old squirrels.

To fry, dredge squirrel pieces in flour mixed with pepper and plenty of seasoned salt. Taste the flour. The flavor of seasoned salt should be distinct. Pour enough vegetable oil in a skillet to cover the bottom to a depth of about $\frac{1}{3}$ inch and heat to 350 degrees. Cook on one side for about eight minutes, or until you can see the sides browning. Gently turn the pieces over and cook for six or seven minutes, or until evenly browned. Remove from pan and drain well on paper toweling.

BARBECUED SQUIRREL

This recipe will make any old squirrel tender and delicious. Place squirrel pieces you wish to cook in a large pot. Cover with water and add enough seasoned salt to tinge the water orange. Bring water to a boil, then reduce heat and simmer for two hours. Lay two large pieces of heavy-duty tinfoil across each other on top of a large serving tray. Remove the squirrels from the pot and place them evenly on the tinfoil and serving tray. Add 1 cup broth and 2 tablespoons of butter. Fold edges of tinfoil over squirrels and place tinfoil and squirrels on grill over low coals. Cook for 45 minutes.

Remove squirrels from tinfoil and place directly on grill. Brush on barbecue sauce and cook for another 15 minutes. Remove and serve.

to rinse off any squirrel hair that could cling to the meat. This method greatly reduces the number of hairs that stick to a squirrel's carcass.

Next, cut off the front legs, hind legs, and back meat below the ribs. You will see gland tissue on the front legs where they joined to the body. Remove them. Also, on the inner joint of the hind legs, find a small, triangular patch of light tissue. Cut into it and remove the small, round gland found there.

To remove any hair that still adheres to these pieces of meat, place them under slowly running water and pick the hair off by hand. Though tedious, this work is necessary if you wish to turn a squirrel into fine eating. ▲

Mark Goodwin is a retired teacher, avid outdoorsman and freelance writer from Jackson, Mo.



Ruby-throated hummingbird

ALWAYS COMING HOME

To thrive, migratory birds must find favorable habitat throughout the year, throughout the Americas.

by **BRETT DUFUR**

HIGH UP IN THE ROLLING, mist-covered mountains of Honduras, a small flash of metallic green darts through the forest. The ruby-throated hummingbird is returning home.

Where is “home” to a migratory bird that racks up thousands of miles in its annual trek? In a way, hummingbirds are always coming home — to beneficial habitat throughout the Americas — seeking warm weather, food, and shelter in North America, and farther south into Central and South America.

Hummingbirds bring joy to birdwatchers throughout the Americas. Each of us eagerly awaits the diminutive birds’ yearly return to our flowers and bird feeders — whether in Missouri or in the heart of Honduras.

By April, the hummingbirds outside kitchen windows in Honduras have completed the 1,800-mile migration to Missouri and other Midwestern states. They will spend the spring and summer months feeding on sap, insects, nectar, and at the feeder outside your own kitchen window.

By mid-August, the southward migration of the ruby-throated hummingbird is underway, and by early October most will have left Missouri. Many birds we see all summer long also are heading south as fall approaches. The peak of fall warbler migration begins in mid-August and continues through mid-September. And bird migration, in general, is in full swing into September.

Where exactly do our birds go eight months of the year? And who is working to ensure our birds return? Thankfully, a large network of conservationists working throughout the Americas is fighting to keep the future bright for migratory birds.

Keeping Common Birds Common

For about 60 species of Missouri’s migratory birds racing against winter in the middle of a 3,000-mile migration, finding enough food and quality habitat in many different states and countries throughout the Americas becomes a matter of life and death. Many of North America’s songbirds, raptors, and ducks spend eight months in places like Honduras, Ecuador, and Argentina. Because our birds spend so much of



Indigo bunting

their time elsewhere, no conservation measure at home can be effective without addressing habitat conservation in those other countries.

Improving bird habitat throughout migratory flyways has never been more important. Many migratory birds have experienced population declines. In many instances, present-day bird populations are now less than half of their populations 50 years ago, with some bird groups showing declines as high as 90 percent. Land use changes and loss of habitat are the largest and most obvious obstacles that birds encounter on migration.

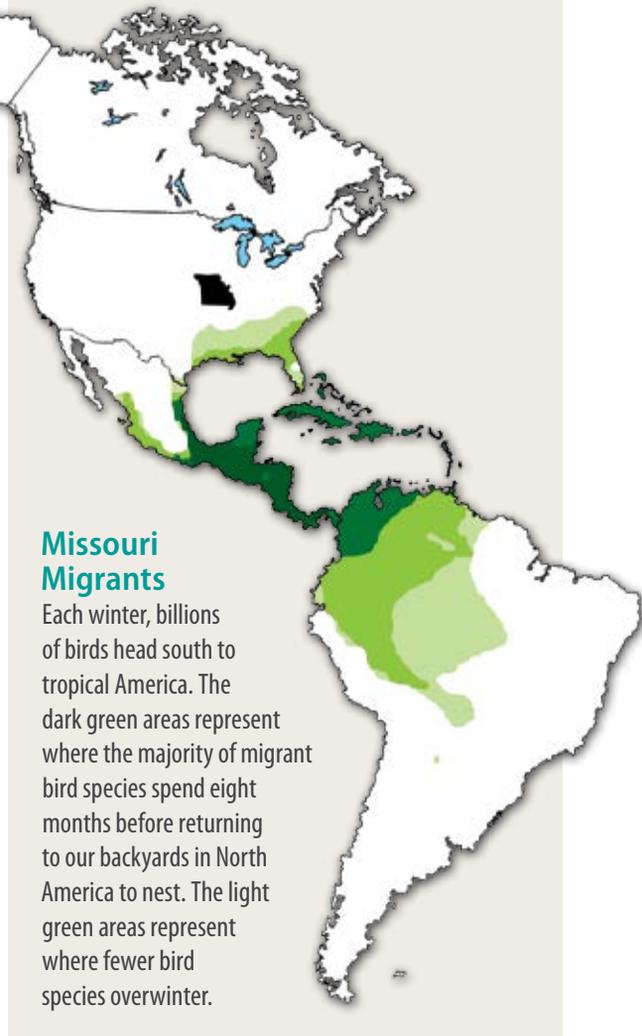
Fortunately, numerous bird conservation partnerships work to conserve important habitat both in Missouri and beyond. That, in concert with sound science and land management in Missouri, ensures that our birds return each spring and summer.

“Our goal is to keep common birds common,” says Department Ornithologist Brad Jacobs. “Many of these birds are showing steep declines, and some are truly in jeopardy. There is no magical way to help all birds by doing one thing in one place. For example, we’ve got 18 species of warblers that all go someplace different.”

Improving Local Habitat

If you’ve ever been on a long road trip, you know how nerve-racking it can be to run out

Improving habitat on your land for wildlife, such as edge feathering to create protective shrubby habitat for quail, helps to provide fuel and shelter for migratory birds. The Conservation Department actively manages habitat on thousands of acres throughout the state.



of gas. Now imagine you’re a bird, like a bobolink that finished raising its young in Harrison County and is now beginning a 6,000-mile southward migration. On that long journey from Harrison County to Argentina, South America, finding adequate food to fuel your flight is paramount to survival. Fortunately, the habitat improvements made for quail, turkey, and other resident wildlife in Missouri have the added benefit of helping migratory birds that are beginning, or are in the middle of, their yearly trek.

“As you improve habitat on your land for quail, turkey, or deer, remember that you’re also providing much needed fuel and shelter for migratory birds,” says Clint Dalbom, Department agriculture liaison. “For example, creating nesting and brood-rearing habitat for quail also benefits a suite of migratory grass-land birds, including bobolinks. Every August, you can watch these birds gather in flocks as they prepare to leave their nesting grounds in northern Missouri to winter in balmy Brazil

PHOTO BY CLIFF WHITE



and Argentina, a round trip of approximately 12,000 miles.”

Last year, the Department made more than 5,500 on-site visits with landowners and homeowners to assist with grassland and woodland management, and improvements to stream banks and riparian corridors.

“The benefits of planting native warm-season grass, edge feathering fields, or improving your woodlands by thinning them out can provide ideal nesting cover for many migrant birds, as well as a host of other species, like quail and wild turkeys,” Dalbom says. “When we manage for short, shrubby grassland habitat, we benefit migrants such as prairie warblers, field spar-

rows, and blue-winged warblers, as well as some of our favorite permanent residents like rabbits, quail, turkeys, and deer.”

Restoring Missouri’s Best Habitats

The Conservation Department actively manages habitat on thousands of acres throughout the state. “Many of the conservation areas where the Department is restoring bottomland forests along riverways, such as at Donaldson Point, Four Rivers, and Black Island, benefit migratory birds, not to mention all of the other wetlands the Department manages for many migratory birds and waterfowl,” says Mike Leahy, the Department’s natural areas coordinator.

The Ozarks are home for 35 percent of the world’s population of whippoorwills. Conservation of migratory bird species requires effective partnerships wherever they roam, to ensure they return annually to raise their young in Missouri.



Scientists often use mist nets, an almost invisible mesh of fine threads that birds have difficulty seeing, to study songbirds. As birds are caught, they are removed, banded, weighed, measured, and then released.

“Also, our bigger conservation areas, such as Sunklands, Angeline, and Peck Ranch provide extensive areas where many songbirds come to breed each summer,” Leahy says.

The Conservation Department works with Missourians to conserve Missouri’s best remaining examples of a wide variety of habitats, such as wetlands, glades, prairies, and forests, which all meet specific habitat needs for a variety of migratory birds. Not only are they important for wildlife, they are also great places for Missourians to get out and birdwatch.

Learning More About Our Birds

Deep in Missouri’s Ozark forests, researcher Paul Porneluzi studies songbirds that migrate to Missouri’s forests to breed and raise their young, as well as those that use Missouri’s forests as stopover habitat on their way to somewhere else.



“Missouri’s Ozarks are home to an incredible diversity of birds that come here to nest. Ovenbirds, Acadian flycatchers, yellow-breasted chats, hooded warblers, white-eyed vireos, prairie warblers, the list goes on and on,” says Porneluzi, a Central Methodist University biology professor and a lead researcher for the Missouri Ozark Forest Ecosystem Project’s (MOFEP) neotropical migrant bird study, funded by the Conservation Department.

Porneluzi’s studies show that active management of Missouri’s forests can benefit more bird species. “Many of these birds require mature forest and some of them require the dense, shrubby habitat that grows in the openings after

MIST NET PHOTO BY CLIFF WHITE; BIRD MEASURING PHOTO BY RICK THOM

Partnerships Embrace Continental-Scale Bird Conservation

Partnerships beyond Missouri borders allow Conservation Department staff to contribute to science and management efforts with bird conservationists throughout the vast ranges of many migratory birds.

“One of the fun things about bird conservation is knowing that people love birds in their backyards as well as in remote wildernesses,” says Conservation Department Ornithologist Brad Jacobs. “Hondurans, Missourians, Canadians, and other people throughout the Americas share that same love, but just express it in different languages.”

Conservationists from throughout the Americas work together through the North American Bird Conservation Initiative (NABCI). Guided by sound science and effective management, NABCI’s goal is for populations and habitats of North America’s birds to be protected, restored, and enhanced through coordinated efforts at international, national, regional, state, and local levels.

In Missouri, the state-scale equivalent is the Missouri Bird Conservation Initiative (MoBCI), a coalition of more than 60 organizations and agencies that work to conserve birds and their habitats in Missouri.

“By working together, we aim to deliver the full spectrum of bird conservation through regionally based, biologically driven, landscape oriented partnerships. ‘All bird conservation,’ as opposed to single species management, is fast becoming the norm in many states,” says Jacobs.

Conservation-minded bird watchers, hunters, business owners, academicians, state and federal professionals, and citizens are all committed to working together to sustain healthy habitats for the benefit of resident and migrant birds in Missouri and for the enjoyment and economic benefits of Missouri citizens. In the past 10 years, MoBCI has directed more than \$3 million to bird conservation projects in Missouri. Partners have contributed more than \$1.2 million in matching funds.

“This investment has made thousands of acres of bird habitat work possible on public and private lands throughout Missouri,” says retired Wildlife Diversity Chief Gene Gardner.



The Department partners with Arkansas, Iowa, Texas, FUNDAECO, the American Bird Conservancy, and the Global Wildlife Conservation Fund to protect more than 10,000 acres of core migratory bird habitat in the Sierra Caral Mountains of Guatemala.

“Partnerships help coordinate and direct the efforts of the Conservation Department more effectively to help ensure that Missouri has healthy, sustainable bird populations and habitats for future generations to enjoy.”

Bird groups that benefit from MoBCI conservation efforts include neotropical migrants, songbirds, shorebirds, waterfowl and other waterbirds, and resident birds such as bobwhite quail, greater prairie chickens, and ruffed grouse.

In addition, many of the partner organizations, including Department staff, work with bird conservationists not just in Missouri, but throughout the full seasonal cycle of some bird species’ vast breeding and wintering ranges. Missouri partnership connections across landscapes, state boundaries, and continents benefit birds throughout the year.

MoBCI partners, the Conservation Department, and the Missouri Conservation Heritage Foundation help to protect Missouri birds year-round, such as the northern pintails in Canada and cerulean warblers in Guatemala, through habitat enhancement projects. Together, they protect and conserve important migrant bird wintering habitat in Mexico’s Yucatan Peninsula, mountain forest on Guatemala’s Caribbean slope, and breeding habitat in the pothole lakes of Canada.

“Donations to the Foundation’s Missouri Tropical Bird Fund support conservation activities in the

region between eastern Mexico and Panama, where 95 percent of Missouri’s breeding bird species migrate to overwinter,” Jacobs says.

The Foundation is a partner of the Avian Conservation Alliance, which includes seven National Audubon Society chapters, the Department, and other national and international partners, including the American Bird Conservancy, The Nature Conservancy, U.S. Agency for International Development, and individual Central American and Mexican governmental agencies and nongovernmental organizations that promote conservation and environmental education.

Two projects focus on habitat protection of 7,000 acres of forests in Mexico’s Yucatan Peninsula near Cancun and in the state of Izabal, Guatemala. The Department and the Foundation also support staff training, capacity building, education, public outreach, publications, and ecotourism in and around critical conservation lands in Mexico and throughout Central and South America.

The Foundation also is helping to fund the first comprehensive book on the birds of Honduras, which will be published in English and Spanish. This resource will encourage conservation and ecotourism in that country — both to the benefit of Missouri migrants.

Learn more at mobic.org and mochf.org.

a timber harvest. After about seven years, those young trees are too tall for shrub-nesting birds, so the trick is to find the right balance for sustainable timber harvest. If you just have mature forest and don't harvest, you don't have a lot of these birds."

MOFEP is the longest running study of its kind in the nation, using the Ozark forests as a research lab to better understand how a wide variety of fish and wildlife respond to different tree harvest and forest management techniques. For more information on this project, visit mofep.mdc.mo.gov.

A Leader in National and International Bird Conservation Efforts

By being engaged in continental-scale bird conservation, the Conservation Department's research and science — honed in the wetlands, forests, riverways, prairies, and farms of Missouri — assists with conservation efforts throughout the Western Hemisphere.

"Missouri is certainly a leader among states in studying the needs of migratory birds and planning and implementing conservation for them," says Frank Thompson, a U.S. Forest Service research scientist and University of Missouri professor. Thompson collaborates with MOFEP investigators on research that supports bird conservation.

"The Conservation Department is a valuable partner in both contributing to basic avian

research and actively engaging both with national and international bird conservation partners. Not many other states support wildlife research or conservation activities outside their borders to the degree that Missouri does," Thompson says.

This work is important because bird populations don't exist solely in Missouri, they are part of a regional population. "Keeping them here in healthy numbers depends on what's going on around us," Thompson says. "Many of these birds face two challenges. One is breeding habitat loss and fragmentation in the United States, which requires regional approaches to conservation. Another big threat is what's affecting their overwinter survival, such as converting needed habitat to agriculture, habitat fragmentation, and growing human populations. These birds face great hazards in both southern and northern migration, and we need to promote conservation on their wintering grounds and migratory routes."

Keeping Our Birds Coming Home

The Conservation Department works with Missourians to help provide migratory birds with good habitat and a better chance for survival. An estimated 1.6 million Missourians and nonresidents spend an estimated 181.2 million days birdwatching in Missouri. They observe about 335 bird species every year in the state, 170 of which raise their young here. More than 80 of those species leave the state during the non-breeding season, including 54 that leave the United States, spending eight months in Mexico, Central and South America, and the Caribbean, returning each spring to nest throughout Missouri.

By being good stewards of our birds and their habitats in Missouri, it benefits us all. Each of Missouri's migratory bird species links us to our southern neighbors who enjoy and care for these birds for much of the year, as well. We are all connected as distant neighbors. Perhaps some day, you can visit our birds on their wintering range in Honduras, or even Argentina, and thank those conservation-minded distant neighbors who also are working to keep them coming back home. ▲

Brett Dufur is an editor for the Conservation Department.

Honduran children look for birds through a spotting scope. Many of Missouri's songbirds migrate to places like Honduras in the winter.



PHOTO BY RICK THOM



PHOTO BY NOPPADOL PAOTHONG

Summer tanager



White-tailed fawn and doe



STATE of the STATE'S

DEER HERD

How disease and other factors affect our white-tailed deer population.

by JASON SUMNERS and EMILY FLINN

LAST MONTH WE DISCUSSED THE 2012 HEMORRHAGIC disease (HD) outbreak [July; Page 24]. This month we will explain how HD and other factors affect deer populations in Missouri. A deer population increases or decreases based on the difference in birth (fecundity) and death (mortality) rates, which are often influenced by regulations, forage availability (i.e., acorns), predator abundance, and disease outbreaks.

Regulations

Antler Point Restriction

The primary goal of the antler point restriction (APR) was to lower deer densities by increasing doe harvest, not to increase buck age structure. The two might seem unrelated, but often hunters resort to harvesting a doe when they have to pass on young bucks that do not meet the APR. The increased doe harvest yields lower deer densities over time, but also increases buck age structure, as younger bucks are often protected from harvest by the APR. Since the APR has been shown to decrease deer density, at this time it is not biologically or socially acceptable to expand the APR statewide, as deer populations in many southern counties are currently at or below desirable levels and unable to sustain increased doe harvest.

After the APR is implemented, doe and button-buck harvests tend to increase and antlered-buck harvest decreases as hunters fill permits with antlerless deer when unable to harvest a legal buck. As a result, buck survival increases, allowing them to mature into

older age classes. As more bucks are recruited into older age classes, buck harvest again increases after the initial implementation of the APR. Additionally, over time, doe harvest is predicted to decrease as deer populations are reduced and does compose a smaller proportion of the population (see graph below).

Antlerless Permits and Season

The intended purpose of antlerless permits and season is to allow hunters the flexibility to manage deer populations and address deer issues, while providing additional hunting opportunity. However, there is a misperception that when “any number” of antlerless permits are available the population can sustain high doe harvest. A harvest of approximately 20–25 percent of the adult doe population will keep the population stable, any more and the population will decrease, and any less will lead to population increases (see A Deer Harvest Scenario).

Acorn Production

Acorn production can have a substantial effect on deer populations in forest-dominated areas, like southern Missouri. In heavily forested (more than 50 percent) landscapes, acorns compose the majority of a deer’s fall and winter diet. However, in poor acorn crop years, like 2012, deer have to search farther and more frequently for food, often leading them to concentrated food sources such as agriculture, early successional areas, and open areas with high forb abundance. Deer sightings increase and their vulnerability to harvest increases sub-

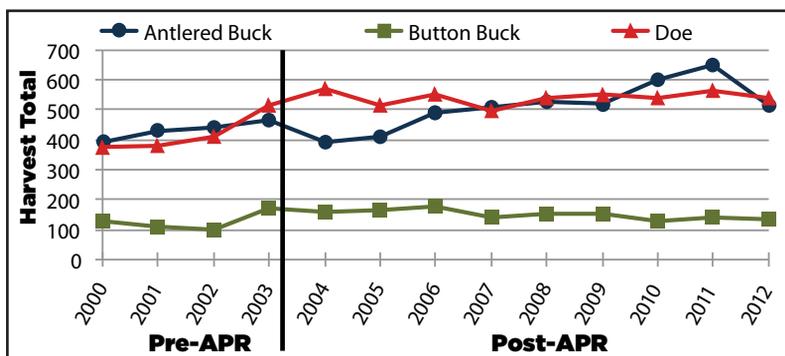
stantially, causing higher deer harvests in forest-dominated areas during acorn “bust” years. However, the opposite occurs in years of good acorn abundance by causing deer to become more evenly distributed with shorter daily movements, thus decreasing sightings and harvest. Areas not dominated by hardwoods, like northern Missouri, experience less acorn production effects, which results in a consistent harvest vulnerability more reflective of actual population trends.

Hemorrhagic Disease

Hemorrhagic disease (HD) can cause local deer populations to decline, but often have minimal long-term, large-scale effects. The causes of HD outbreaks are localized and not completely understood. For example, during 2012, Osage County had the highest reports of deer mortality, but the majority of the reports were limited to one area, with the remainder of the county minimally affected.

Hemorrhagic disease outbreaks in Missouri are often sporadic (rarely occurring in consecutive years) and severe, while in southeastern states they are frequent (every 2–3 years) and

Harvest Composition in a County With Antler Point Restrictions Implemented in 2004



A Deer Harvest Scenario

The following is an example of how to determine the appropriate number of does to harvest to increase, maintain, or decrease a deer population that is estimated at approximately 31 deer per square mile.

31 deer per square mile

35 percent of the population are fawns

- Approximately 11 fawns per square mile

65 percent of the population are adults

- Approximately 20 adults per square mile

1 : 2 Adult sex ratio (buck : doe):

- Approximately 7 bucks per square mile
- Approximately 13 does per square mile

Harvest Recommendations

Increase population:

- 10–15 percent, or two or fewer adult does per square mile

Stabilize population:

- 20–25 percent, or three adult does per square mile

Decrease population:

- 30–35 percent, or four or more adult does per square mile



Significant increases or decreases in carnivore populations, such as coyotes, can influence deer populations.

mild. Missouri experienced significant HD outbreaks previously in 1988, 1998, and 2007; however, the 2012 outbreak appears to be the most widespread and intense on record in Missouri. Unfortunately, there is no way to quickly determine the HD-related mortality within affected areas. Also, the reports that we received are only a small proportion of the mortality that actually occurred as many go unreported.

Ultimately, the population response to an HD outbreak is related to the amount of mortality and growth rate of the population. As mentioned previously, growth of the population is related to births and deaths. If a population has more does than bucks, it will have a higher growth rate than a population of similar total size, but with equal numbers of bucks and does. Additionally, harvest rate greatly influences how a population responds to an HD outbreak. For example, an area where less than 20–25 percent of the adult does are being harvested consistently will recover quicker than a population with doe harvest greater than 20–25 percent. As a result, deer populations vary across the state and will respond in different ways to the recent HD outbreak. Ultimately, the populations with low growth rates coupled with high harvest rates are of greatest concern.

Predator Populations

During the past few years there has been increasing concern regarding the effect of predators, specifically coyotes, on deer populations.



While there have been several coyote predation studies in the southeastern U.S., those results are not applicable in Missouri because coyote populations have historically been present in Missouri, but are relatively new to the southeast. Additionally, recent investigations suggest that southeastern coyotes differ in behavior and appearance from their Midwestern counterparts. While admittedly outdated, research in Missouri has shown that deer make up a small portion of a coyote's diet and much of that appears to be the result of scavenging on deer and not killing. Regardless, significant increases or decreases in carnivore populations can influence deer mortality rates, especially of fawns.

Missouri Deer Management Mission Statement

The mission of the deer program is to use science-based wildlife management to maintain biologically and socially balanced deer populations that provide quality recreational opportunities and minimize human-deer conflicts.

In years with poor acorn crop, deer have to search farther for food. This leads them to open areas with high forb abundance, which increases deer sightings and their vulnerability to harvest substantially.

Regional Breakdown

Statewide population trends are misleading when discussing localized deer population dynamics. Therefore, localized or regional information is more indicative of actual deer population trends observed by hunters and the public. However, there can be considerable variation within a region or even a county. Therefore, regional information should be considered as a starting point when evaluating local deer populations.



Central Region

There is great variation among deer populations within the Central Region. Parts of Audrain, Boone, Callaway, Cooper, Howard, and Saline counties have experienced population declines in the past decade as a result of multiple hemorrhagic disease outbreaks (2007, 2010, and 2012) and high doe harvest. The poor acorn crop boosted the 2012 deer harvest in Cole, Camden, Gasconade, Maries, Miller, Morgan, and Osage counties, increasing by 12 percent from 2011 and 6 percent greater than the 10-year average. It is expected that localized areas will have smaller deer populations over the next several years. As a result, a reduction in doe harvest permits in some Central Region counties is necessary to overcome population declines.



Kansas City Region

Harvest in the Kansas City Region in 2012 was down 6 percent from 2011, which follows a general trend of reduced harvest across the rural areas of the Kansas City Region over the past decade. Counties with the greatest decrease in the 2012 harvest compared to the 10-year average were Platte, Bates, and Pettis, while Benton County increased. A large portion of the region was hit hard by hemorrhagic disease in 2012, with Benton and Henry counties having the most reported cases within the region. In rural areas affected by hemorrhagic disease, it may be necessary to reduce doe harvest to allow deer populations to recover.



Northeast Region

Deer populations in the Northeast Region have been slowly decreasing over the last several years; however, some areas still have high deer populations.

Several areas within the Northeast Region experienced significant hemorrhagic disease mortality, which likely contributed to the 6-percent decrease in deer harvest from 2011. In general, deer populations in many parts of the Northeast Region have been stable to slightly increasing, including Adair, Lewis, Putnam, Sullivan, Clark, and Schuyler counties. Some counties have experienced declines with the most dramatic being in Monroe, Randolph, and Shelby. However, the 2012 hemorrhagic disease outbreak will result in some localized reductions in deer populations. Localized decreases in doe harvest, without regulation changes, should be sufficient to allow recovery of populations reduced by hemorrhagic disease mortality.



Northwest Region

There has been a steady reduction in the deer population and harvest over the past decade in the Northwest Region with harvest in 2012 decreasing by 10 percent from the 10-year average. Declining harvest is a reflection of lower deer populations across many counties, including Atchison, Caldwell, Carroll, Clinton, Daviess, Nodaway, and Ray. Large concentrations of deer are far less common today than in the early 2000s in many of these areas. In areas that were heavily affected by hemorrhagic disease in 2012, a reduction in doe harvest is likely warranted to aid population recovery. However, a few counties, including Worth and Mercer, continue to have strong deer populations. Additionally, changes in land use within the region are reducing the amount of available habitat, which may be contributing to localized reductions in deer density.



Ozark Region

Deer populations in the Ozark Region have been slowly increasing over the past decade as a result of continued conservative regulations on antlerless harvest. A slowly increasing population and poor acorn abundance is reflected by a 22-percent increase in deer harvest from 2011 to 2012. Ozark counties with the greatest deer harvest increase compared to the 10-year average harvest were Pulaski, Shannon, Carter, Howell, and Ripley. Both 2010 and 2011 had relatively good acorn crops, which, as previously mentioned,

made them less vulnerable to harvest, allowing populations to increase. The past years of good acorn production also provided much-needed nutrition, potentially resulting in greater fawn production, which helps boost populations. Increased deer populations across the Ozarks are well accepted as deer populations remain below biological and social carrying capacity.



Southeast Region

Deer populations in the Southeast Region have been slowly increasing over the past decade, which is reflected in harvest trends. Slowly increasing populations and a poor acorn crop resulted in a 22-percent increase in deer harvest from 2011 to 2012. The previous two years experienced good acorn production, made deer less vulnerable to harvest, and increased fawn production. Populations are expected to continue slowly increasing, as regulations remain restrictive. Increased deer populations across the Southeast Region are well accepted because, in most locations, populations remain below desirable levels. Additionally, the Southeast Region appears to be the only Missouri region to escape significant deer mortality due to hemorrhagic disease in 2012.



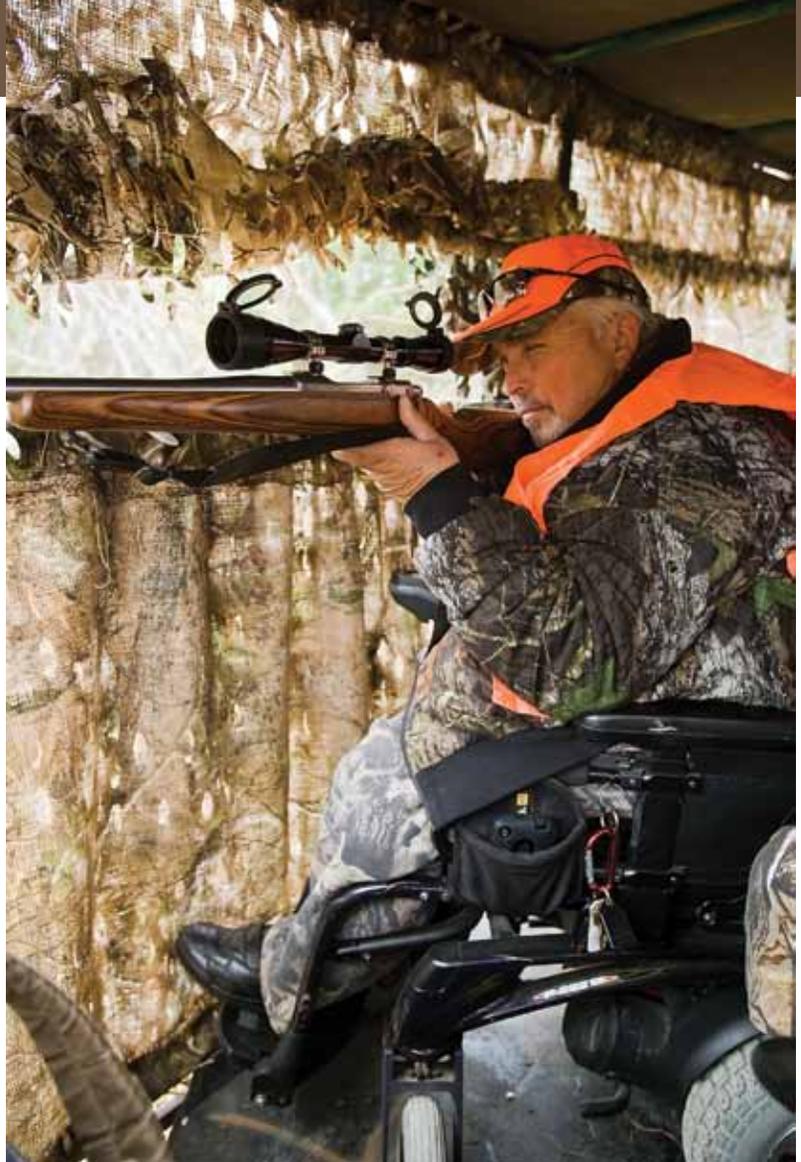
St. Louis Region

Outside of the urban areas, the St. Louis Region deer populations have been stable or slowly increasing over the past several years. Deer harvest in the St. Louis Region in 2012 increased 18 percent from 2011. The increased harvest can be partially attributed to the poor acorn crop in the southern parts of the region, especially in Washington, Franklin, and Jefferson counties. The St. Louis Region did experience moderate hemorrhagic disease mortality in 2012, but was not as severely affected in comparison to other regions across the state.



Southwest Region

Deer populations in most of the Southwest Region have been slowly increasing since a reduction in the availability of antlerless permits was instituted in 2008. In 2012, poor acorn production resulted in more deer sightings by hunters, re-



sulting in an increased harvest. Thus, harvest in the Southwest Region was up 12 percent from 2011, but may be more reflective of a poor acorn production rather than the slowly increasing population. The greatest harvest increase during 2012 compared to the 10-year average occurred in Stone, Dallas, Greene, and Laclede counties. Like many other parts of the state, the Southwest Region was hit hard by hemorrhagic disease in 2012. With the increased harvest and hemorrhagic mortality, we expect some areas to have reduced deer populations over the next few years. In local areas where population declines are apparent, landowners and hunters should consider harvesting fewer does in 2013. ▲

Regional information is more indicative of actual deer population trends observed by hunters and the public.

Jason Sumners and Emily Flinn are statewide deer biologists for the Department of Conservation and work at the Central Regional Office and Conservation Research Center in Columbia.

Green Heron

Many anglers, including these yellow-legged waders, enjoy spending summer in Missouri testing their artificial lures.

LATE SUMMER ALWAYS brings a burst of activity to our pond as green herons make the transition from needy nestlings to feathered foragers of salamanders, tadpoles, and frogs. Although the pond, now fishless after decades of eutrophication, offers easy pickings of the aforementioned prey, foraging space is limited to about $\frac{1}{3}$ acre. The ensuing drama is irresistible to watch and photograph as the squawky young herons compete for the best vantage points from which to seize unsuspecting amphibians from the water.

The green heron (*Butorides virescens*) is a small, stocky wading bird with yellow legs, a long, two-toned bill, and a glossy, blue-green cap. Its plumage is mostly dark green but its breast and neck are chestnut with contrasting streaks of white. Whenever I see a green heron twisting its head and neck to the side, I'm reminded of old-fashion taffy candy as the ribbons of white swirl through the brownish-red plumage.

Watching a green heron fish is mesmerizing but it requires patience as an individual might stare into the water, perfectly motionless, for five minutes or more. Finally, after you think it will never strike, it begins to extend its retractable neck to an impossible length before it jabs the water and retrieves its prey. Green herons are also known to use bait, if necessary, to catch prey. I recently watched a video of a green heron dropping scraps of bread in a lake to lure carp close enough to snatch from the water. These avian anglers are even equipped to fish in waters requiring "artificial baits only" as they have been observed using feathers or other objects to lure fish.

Green herons build a nest of sticks in a tree or shrub near water and produce a clutch of two to six eggs. I try to stay clear of my pond each spring as a new pair sets up household in a cedar tree near water's edge. They make it clear that I am not welcome as they take flight and jump from tree to tree, sending out their loud "kuk-kuk-kuk" at my approach. Once the nestlings fledge, the parents are less concerned with my presence and the young birds appear more preoccupied with each other than me. I enjoy watching the constant exchange of fishing spots among the siblings as an inevitable pecking order develops. I feel sorry for the more submissive birds as they scan the sky for bullies as much as they monitor the water for prey.

As the days grow shorter and cooler, the green heron sightings at our pond decrease. First, the young birds begin to expand their range to the nearby Bourbuese River and eventually all of them disappear for southern wintering grounds. I'm always a little sad to see them go but I take comfort in knowing that a new pair of the squawky visitors will return the following spring to begin the process anew.

—Story and photos by Danny Brown

 500mm lens • f/4.0 • 1/640 sec • ISO 400

We help people discover nature through our online field guide. Visit mdc.mo.gov/node/73 to learn more about Missouri's plants and animals.



Little Black Conservation Area

Discover something new in this Ozark area's forests, fens, and natural areas.

DISPERSED THROUGHOUT THIS 2,970-acre area in the Missouri Ozarks are rivers, wetlands, and forests containing some of the state's oldest white oaks. Little Black Conservation Area (CA) in Ripley County showcases a variety of natural Ozark specialties for visitors to discover.

Among these are two designated natural areas, Fern Nook Natural Area (NA) and Overcup Fen NA. High-quality forest resources and old growth stands dominate Fern Nook NA. The natural area features a broad range of tree species including sweet gum, ash, elm, sugar maple, pecan, bitternut hickory, white oak, shumard oak, and bur oak. Upland areas in Fern Nook NA also support pine, black oak, and post oak, and one northern slope holds Missouri's oldest known white oaks, dating back to the early 1600s.

The name "Fern Nook" comes from a nearby historic post office. Today some of the oldest known oak trees in Missouri are within 10 miles of the Grandin Mill site, once one of the largest timber mills in the nation.

Overcup Fen NA boasts bottomland forests with overcup oaks as well as four unique, spring-fed wetlands known as fens. Fens form when groundwater percolates to the surface. Fens often harbor rare plant and animal species; in fact, Overcup Fen NA supports a population of the federally endangered Hine's emerald dragonfly.

Two rivers accompany Little Black CA's two natural areas, the North and South prongs of the Little Black River. The area offers fishing opportunities for bass, suckers, and sunfish, as well as hunting for deer, turkey, and small game. Bowhunters can gear up for their seasons at Little Black CA's archery range featuring 34 targets, four of which are disabled-accessible.



17-40mm lens • f/4.5 • 1/160 sec • ISO 800

Little Black CA is the site of a large shortleaf pine and oak woodland restoration project. At the turn of the century extensive shortleaf pine and oak woodlands were present on the rolling terrain of the Ripley County Ozarks, but these have greatly diminished due to lack of fire and overabundance of trees. Today foresters are using selective thinning and prescribed fire to restore this natural community rich in native plants and animals.

Little Black CA is located 8 miles north of Doniphan off Highway 21 and Route NN. For an area map and brochure, visit the website listed below.

—Story by Rebecca Martin, photo by David Stonner



Recreation opportunities: Archery range, bird watching, fishing, hiking, hunting in season, primitive camping

Unique features: This area features two designated natural areas rich in native wildlife diversity, Overcup Fen NA and Fern Nook NA.

For More Information Call 573-226-3616 or visit mdc.mo.gov/a7110.

Kids in Nature

Lay in the grass and listen. Name the summer sounds you hear.

Watch for **hummingbirds** at feeders.

Finger paint with mud. Scoop some from a puddle or dig a hole in your backyard. Sidewalks and driveways are great places to draw temporary artwork.



Visit a **pond** or **lake** and look for wildlife. Keep a nature journal and draw pictures and write descriptions of what you see.

Kids in Nature Photo Contest!

Break out those cameras and send us your best images of you and your family enjoying the outdoors for our new photo contest. Once again, we will be accepting entries via the online photo sharing service, Flickr. If you are not a member of Flickr, it is easy and free to join. Once you are a member, just navigate to our kids in nature group page: www.flickr.com/groups/mdc-kids-in-nature and submit your photos. MDC staff will select a winner every month and display it on our website. All of the monthly winners will appear in the January 2014 issue of the magazine.



Simple Ideas
for Family Fun

Try to spot a blooming **blazing star** flower.



Look for a yellow garden spider on its web in your yard or in the park.

Purple martins are gathering for migration. See if you can spot one.





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I Am Conservation

"Prairies have been important to me since I was a small child — only I didn't know about prairies then," said Doris Sherrick, vice president of the Missouri Prairie Foundation (MPF). "I only knew I loved the pale purple coneflowers, spiderworts, birdsfoot violets, and other flowers that once bloomed along the country roads in Franklin County where I grew up." Love of the land led Sherrick to become an ardent conservationist. Sherrick also serves on the board of the South Grand River Watershed Alliance, is a Stream Team member, and has been instrumental in bringing more recycling opportunities to Cass County, where she lives. Sherrick and her husband, Bob, joined MPF in the 1990s. "We had become increasingly aware of the alarming rate that native prairie was being lost forever because of changes in land use. I was so happy to learn of an organization that was working not only to protect and restore prairie, but also to reach out to Missourians with information and events to help them understand the ecological richness of prairie — as well as its beauty and benefits to people and wildlife — and inspire them to join in with efforts to protect the little that remains." —*photo by Noppadol Paothong*